

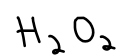
Ch 7 - Language of Chemistry

Ch 7 - Language of Chemistry

Chemical Formulas

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Chemical Formulas



Ch 7 - Language of Chemistry

Chemical Formulas

	H_2O	H_2O_2
1 mole :	2 atoms H : 1 atom O	2 atoms H : 2 atoms O

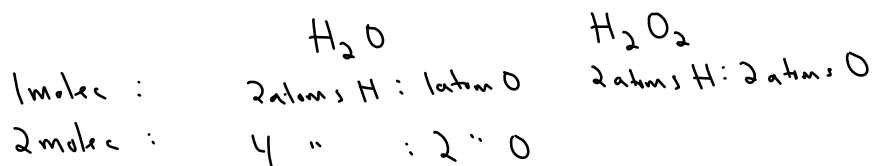
Ch 7 - Language of Chemistry

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Ch 7 - Language of Chemistry

Chemical Formulas



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Chemical Formulas

	H_2O	H_2O_2
1 mole :	2 atoms H : 1 atom O	2 atoms H : 2 atoms O
2 moles :	4 " : 2 " O	4 " " : 4 atoms O
6×10^{23} moles		

Ch 7 - Language of Chemistry

Chemical Formulas

	H_2O	H_2O_2
1 mole :	2 atoms H : 1 atom O	2 atoms H : 2 atoms O
2 moles :	4 " : 2 " O	4 " : 4 atoms O
6×10^{23} moles	1.2×10^{24} " : 6×10^{23} " O	1.2×10^{24} atoms H : 1.2×10^{24} atoms O

Ch 7 - Language of Chemistry

Chemical Formulas

	H_2O	H_2O_2
1 molec :	2 atoms H : 1 atom O	2 atoms H : 2 atoms O
2 molec :	4 " : 2 " O	4 " : 4 atoms O
6×10^{23} molec	1.2×10^{24} " : 6×10^{23} " O	1.2×10^{24} atoms H : 1.2×10^{24} atoms O
1 mol	2 mol H : 1 mol O	2 mol H : 2 mol O

Ch 7 - Language of Chemistry

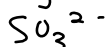
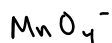
Chemical Formulas

	H_2O	H_2O_2	Subscript mean atoms when molecules, and moles when you have a mol of comp
1 molec :	2 atoms H : 1 atom O	2 atoms H : 2 atoms O	
2 molec :	4 " : 2 " O	4 " : 4 atoms O	
6×10^{23} molec	1.2×10^{24} " : 6×10^{23} " O	1.2×10^{24} atoms H : 1.2×10^{24} atoms O	
1 mol	2 mol H : 1 mol O	2 mol H : 2 mol O	

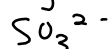
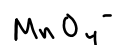
Ionic Comp Formulas

Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0

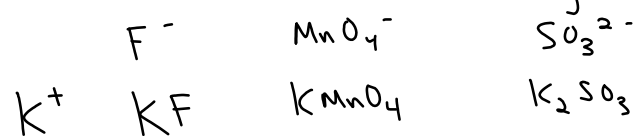
Ionic Comp Formulas \rightarrow Ions combine so Net
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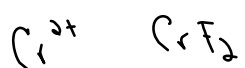
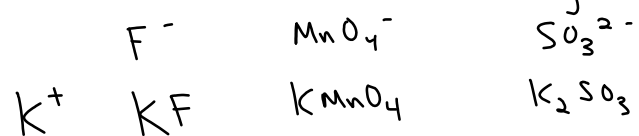
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



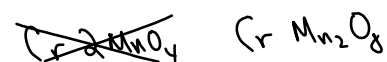
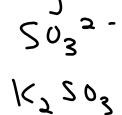
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



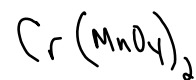
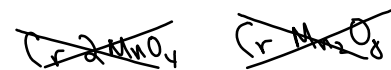
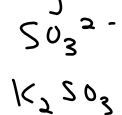
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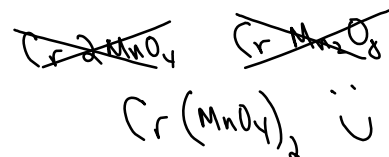
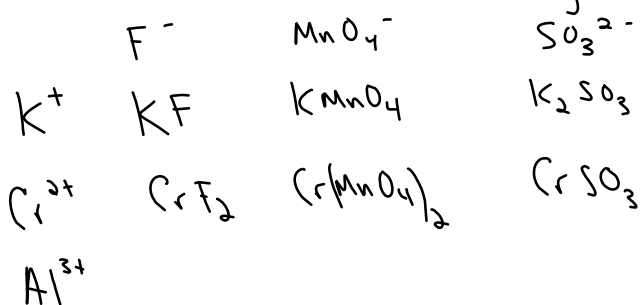
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



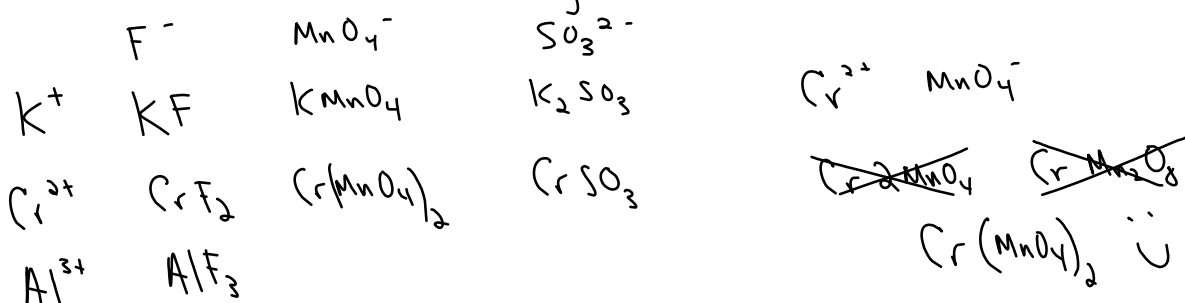
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



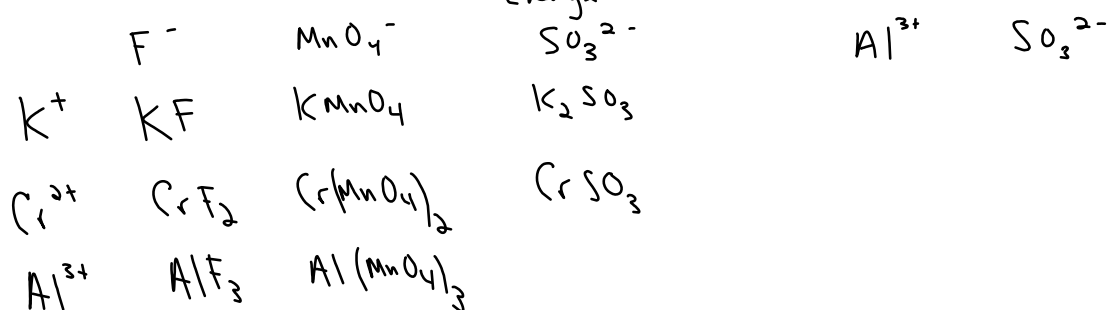
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



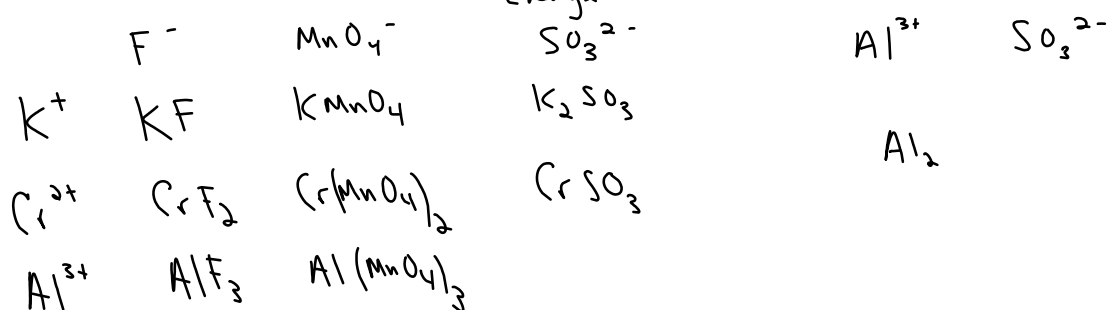
Ionic Comp Formulas \rightarrow Ions combine so Net
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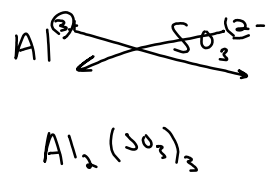
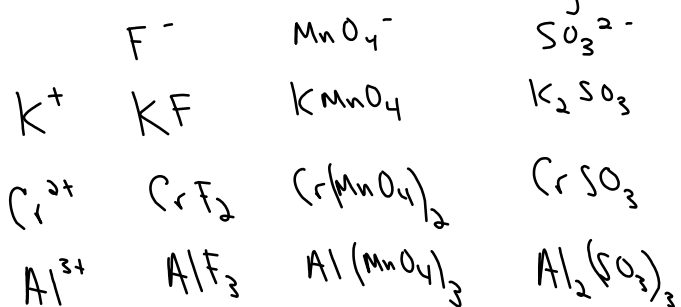
Ionic Comp Formulas \rightarrow Ions combine so Net
charge = 0



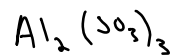
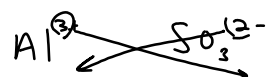
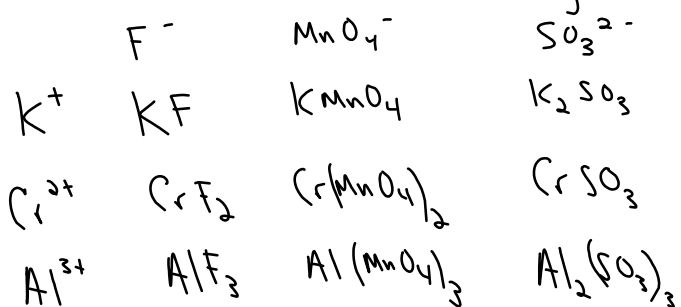
Ionic Comp Formulas → Ions combine so Net
charge = 0



Ionic Comp Formulas → Ions combine so Net
charge = 0



Ionic Comp Formulas → Ions combine so Net charge = 0



Cross
Cross
Method

Naming Ionic Compounds

Naming Ionic Compounds

NaCl sodium chloride

Naming Ionic Comp

NaCl sodium chloride

2 steps

Naming Ionic Comp

NaCl sodium chloride

2 steps

1. Name cation

Naming Ionic Compounds

NaCl sodium chloride

2 steps

1. Name cation
2. Name anion

Naming Ionic Compounds

NaCl sodium chloride

K_2SO_3

BaF_2

SnI_2

$\text{Fe}_2(\text{SO}_4)_3$

2 steps

1. Name cation

2. Name anion

Naming Ionic Comp

NaCl sodium chloride

K_2SO_3 potassium sulfite

2 steps

1. Name cation

2. Name anion

BaF_2

SnI_2

$\text{Fe}_2(\text{SO}_4)_3$

Naming Ionic Compounds

NaCl sodium chloride

K_2SO_3 potassium sulfite

BaF_2 Barium fluoride

SnI_2

$\text{Fe}_2(\text{SO}_4)_3$

2 steps

1. Name cation

2. Name anion

Naming Ionic Compounds

NaCl sodium chloride

K_2SO_3 potassium sulfite

2 steps

1. Name cation

2. Name anion

BaF_2

Barium fluoride

SnI_2

tin(II) iodide
Stannous iodide

$\text{Fe}_2(\text{SO}_4)_3$

Naming Ionic Comp

NaCl sodium chloride

K_2SO_3 potassium sulfite

2 steps

1. Name cation

2. Name anion

BaF_2

Barium fluoride

SnI_2

{ tin(II) iodide → stock system
stannous iodide → old system

$\text{Fe}_2(\text{SO}_4)_3$

Naming Ionic Comp

NaCl sodium chloride

K_2SO_3 potassium sulfite

2 steps

1. Name cation

2. Name anion

BaF_2

Barium fluoride

SnI_2

{ tin(II) iodide → stock system
Stannous iodide → older system

$\text{Fe}_2(\text{SO}_4)_3$

Iron(III) sulfate

or
Ferric sulfate



2/4

Naming Covalent Compounds
↳ 2 nonmetals bonded to each other

2/4

Naming Covalent Compounds
↳ 2 nonmetals bonded together

CO_2

2/4

Naming Covalent Compounds
↳ 2 nonmetals bonded together

CO_2 - carbon dioxide

CO - carbon monoxide

2/4

Naming Covalent Compounds
↳ 2 nonmetals bonded together

CO_2 - carbon dioxide

CO - carbon monoxide

As_2O_5 - diarsenic pentoxide

2/4

Naming Covalent Compounds

↳ 2 nonmetals bonded together

CO_2 - Carbon dioxide

CO - Carbon monoxide

As_2O_5 - diarsenic pentoxide

Step 1 - name 1st element
giving it a numeric prefix
if more than 1

2/4

Naming Covalent Compounds

↳ 2 nonmetals bonded together

CO_2 - Carbon dioxide

CO - Carbon monoxide

As_2O_5 - diarsenic pentoxide

Step 1 - name 1st element
giving it a numeric prefix
if more than 1

Step 2 - name 2nd element
giving it a numeric prefix
& -ide suffix

numeric prefixes

1 mono	6 hexa
2 di	7 hepta
3 tri	8 octa
4 tetra	9 nona
5 penta	10 deca

numeric prefixes

1 mono

2 di

3 tri

4 tetra

5 penta

6 hexa

7 hepta

8 octa

9 nona

10 deca

N_2O_6

PCl_3

S_2Cl_5

trinitrogen hepta sulfide

oxygen di fluoride

numeric prefixes

1 mono

2 di

3 tri

4 tetra

5 penta

6 hexa

7 hepta

8 octa

9 nona

10 deca

N_2O_6 dinitrogen hex oxide

PCl_3

S_2Cl_5

trinitrogen hepta sulfide

oxygen di fluoride

numeric prefixes

1 mono	6 hexa
2 di	7 hepta
3 tri	8 octa
4 tetra	9 nona
5 penta	10 deca

N_2O_6 dinitrogen hex oxide

PCl_3 phosphorus tri chloride

S_2Cl_5 disulfur pentachloride

trinitrogen heptasulfide

oxygen di fluoride

numeric prefixes

1 mono	6 hexa
2 di	7 hepta
3 tri	8 octa
4 tetra	9 nona
5 penta	10 deca

N_2O_6 dinitrogen hex oxide

PCl_3 phosphorus tri chloride

S_2Cl_5 disulfur pentachloride

trinitrogen heptasulfide N_3S_7

oxygen di fluoride

numeric prefixes

1 mono	6 hexa
2 di	7 hepta
3 tri	8 octa
4 tetra	9 nona
5 penta	10 deca

N_2O_6 dinitrogen hex oxide

PCl_3 phosphorus tri chloride

S_2Cl_5 disulfur pentachloride

trinitrogen heptasulfide N_3S_7

oxygen di fluoride OF_2

Naming Acids

Naming Acids

↳ Any comp whose formula
starts w/ H

Naming Acids

↳ Any comp whose formula
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2 kinds of Acids

Naming Acids

↳ Any comp whose formula
starts w/ H

2 kinds of Acids

Binary Acids

Ternary Acids
(oxyacids)

Naming Acids

↳ Any comp whose formula
starts w/ H

2 kinds of Acids

Binary Acids - H + other element
(Ex. HCl, HBr, H₂S)

Ternary Acids
(oxyacids)

Naming Acids

↳ Any comp whose formula
starts w/ H

2 kinds of Acids

Binary Acids - H + other element
(Ex. HCl, HBr, H₂)

Ternary Acids
(oxyacids)

Naming Acids

↳ Any comp whose formula starts w/ H

2 kinds of Acids

Binary Acids - H + other element
(Ex. HCl, HBr, H₂S)

Ternary Acids - H + polyatomic ion
(oxyacids) (HNO_3 , HClO_2 , H_2SO_4)

Naming Acids

↳ Any comp whose formula starts w/ H

2 kinds of Acids

Binary Acids - H + other element
(Ex. HCl, HBr, HI)

Ternary Acids - H + polyatomic ion
(oxoacid) (HNO3, HClO4, H2SO4)

Binary Acids

Binary Acids

HCl -

Binary Acids

HCl - hydrochloric acid

Binary Acids

HCl - hydrochloric acid

HBr -

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

Naming Rules

hydro-^{element}_{name}-ic acid

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

Naming Rule

hydro- ^{element}_{name} - ic acid

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

HF -

Naming Rules

hydro- ^{element}_{name} - ic acid

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

HF - hydrofluoric acid

Naming Rules

hydro- ^{element}_{name} - ic acid

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

HF - hydrofluoric acid

Naming Rules

hydro- ^{element}_{name} - ic acid

HI -

Binary Acids

HCl - hydrochloric acid

HBr - hydrobromic acid

HF - hydrofluoric acid

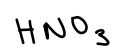
Naming Rules

hydro- ^{element}_{name} -ic acid

HI - hydroiodic acid

Ternary Acids

Ternary Acids



Ternary Acids

HNO_3 - Nitric acid

Ternary Acids

HNO_3 - Nitric acid

HClO_2 -

Ternary Acids

HNO_3 - Nitric acid

HClO_2 - chlorous acid

Ternary Acids

HNO_3 - Nitric acid

HClO_2 - chlorous acid

Naming Ternary
Acids

NO HYDROPREFIX

Ternary Acids

HNO₃ - Nitric acid

HClO₂ - chlorous acid

Naming Ternary Acids

NO HYDROPREFIX

Anion Name {
 → ate → ic + acid
 → ite → ous

Ternary Acids

HNO₃ - Nitric acid

HClO₂ - chlorous acid

Naming Ternary Acids

NO HYDROPREFIX

Anion Name {
 → ate → ic + acid
 → ite → ous

Ternary Acids

HNO₃ - Nitric acid

HClO₂ - chlorous acid

H₂CrO₄ →

Naming Ternary Acids

NO HYDROPREFIX

Anion Name {
→ ate → ic + acid
→ He → ous

Ternary Acids

HNO₃ - Nitric acid

HClO₂ - chlorous acid

H₂CrO₄ → chromic acid

Naming Ternary Acids

NO HYDROPREFIX

Anion Name { → ate → ic + acid
 → He → ous

Ternary Acids

HNO₃ - Nitric acid

HClO₂ - chlorous acid

H₂CrO₄ → chromic acid

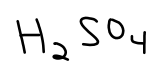
Naming Ternary Acids

NO HYDRO PREFIX

Anion Name {
→ ate → ic + acid
→ ite → ous

→ 2 b/c 2 H⁺'s cancel
-2 charge of CrO₄²⁻

Exception!



Exception!

H_2SO_4 - sulfuric acid

H_3PO_4 - phosphoric acid

Percent Composition

Percent Composition

what is the % of H in H_2O ?

Percent Composition

What is the % of H in H_2O ?

11% H

89% O

Percent Composition

what is the % of H in H_2O ?

~~11% H~~
~~33% O~~

Percent Composition by mass

what is the % of H in H_2O ?

~~11% H
88% O~~

Percent Composition by mass

$$\% \text{ comp} = \frac{\text{mass element in compound}}{\text{total mass of compound}} \times 100\%$$

Percent Composition by mass

$$\% \text{ comp} = \frac{\text{mass element in compound}}{\text{total mass of compound}} \times 100\%$$

% H in H₂O?

Percent Composition by mass

$$\% \text{ comp} = \frac{\text{mass element in compound}}{\text{total mass of compound}} \times 100\%$$

% H in H₂O?

$$\frac{2\text{g}}{18\text{g}} \times 100\% = 11\% \text{ H}$$

Percent Comp

What is the % of N in
Lithium nitrate?

Percent Comp

What is the % of N in
Lithium nitrate?



Percent Comp

What is the % of N in
Lithium nitrate?



$$\frac{14 \text{ g N}}{69 \text{ g LiNO}_3} \times 100 \% = 20.3\% \text{ N}$$

How many g of Ca are
in 38.0g CaCl_2 ?

How many g of Ca are
in 38.0g CaCl_2 ?

Step 1 Find % of Ca
in CaCl_2

How many g of Ca are
in 38.0g CaCl_2 ?

Step 1 Find % of Ca
in CaCl_2



$$\frac{40 \text{ g Ca}}{111 \text{ g CaCl}_2} \times 100\% =$$

36	% Ca
----	------

↓

How many g of Ca are
in 38.0g CaCl_2 ?

Step 1 Find % of Ca
in CaCl_2



$$\frac{40 \text{ g Ca}}{111 \text{ g CaCl}_2} \times 100\% = \boxed{36\% \text{ Ca}}$$

Step 2 Use the % of the whole
to find mass of element in
the sample given →

How many g of Ca are
in 38.0g CaCl_2 ?

Step 1 Find % of Ca
in CaCl_2 \rightarrow

$$\frac{40 \text{ g Ca}}{111 \text{ g CaCl}_2} \times 100\% = \boxed{36\% \text{ Ca}}$$

Step 2 Use the % of element
to find mass of element in
the sample given \rightarrow

$$0.36 \times 38.0 \text{ g} = \boxed{13.7 \text{ g Ca}}$$

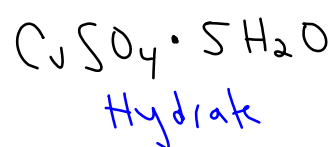
(% element
as decimal)

Hydrate Lab

Hydrate - Comp w/ water as part of its formula

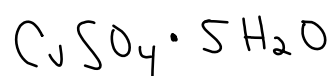
Hydrate Lab

Hydrate - comp w/ water as part of its formula



Hydrate Lab

Hydrate - Comp w/ water as part of its formula

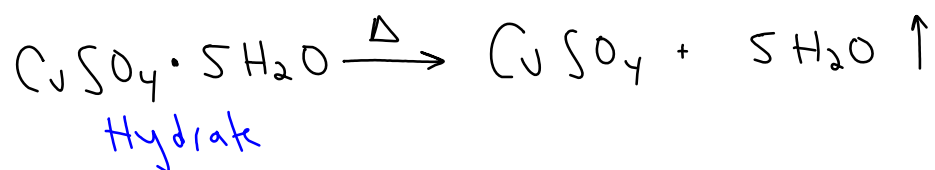


Hydrate

$$\% \text{H}_2\text{O} = \frac{\text{mass H}_2\text{O}}{\text{mass hydrate}} \times 100\%$$

Hydrate Lab

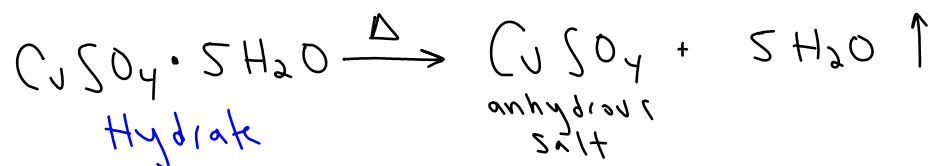
Hydrate - Comp w/ water as part of its formula



$$\% \text{H}_2\text{O} = \frac{\text{mass H}_2\text{O}}{\text{mass hydrate}} \times 100\%$$

Hydrate Lab

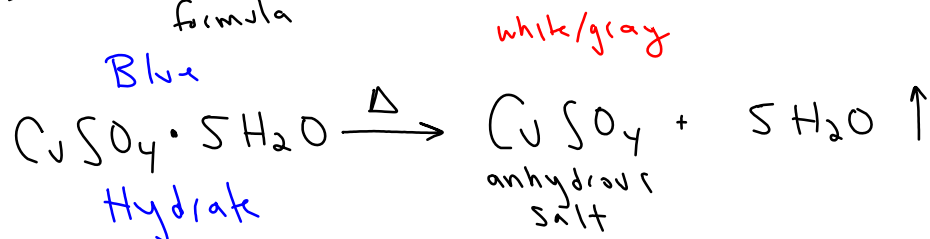
Hydrate - Comp w/ water as part of its formula



$$\% \text{H}_2\text{O} = \frac{\text{mass H}_2\text{O}}{\text{mass hydrate}} \times 100\%$$

Hydrate Lab

Hydrate - Comp w/ water as part of its formula



$$\% \text{H}_2\text{O} = \frac{\text{mass H}_2\text{O}}{\text{mass hydrate}} \times 100\%$$

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particlos"}$$

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements →

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent compds

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent combs \rightarrow molecule

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent comp \rightarrow molecule

ionic comp -

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent comp \rightarrow molecule

ionic comp \rightarrow formula unit (fu)

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent comp \rightarrow molecule

ionic comp \rightarrow formula unit (fu)

$$1\text{mol Cu} = 6.022 \times 10^{23} \text{ Cu atoms}$$

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent comp's \rightarrow molecule

ionic comp's \rightarrow formula unit (fu)

$$1\text{mol Cu} = 6.022 \times 10^{23} \text{ Cu atoms}$$

$$1\text{mol H}_2\text{O} = 6.022 \times 10^{23} \text{ H}_2\text{O molec}$$

Mol concept

$$1\text{mol} = 6.022 \times 10^{23} \text{ "particles"}$$

"particles"

elements \rightarrow atoms

covalent comp's \rightarrow molecule

ionic comp's \rightarrow formula unit (fu)

$$1\text{mol Cu} = 6.022 \times 10^{23} \text{ Cu atoms}$$

$$1\text{mol H}_2\text{O} = 6.022 \times 10^{23} \text{ H}_2\text{O molec}$$

$$1\text{mol NaCl} = 6.022 \times 10^{23} \text{ fu NaCl}$$

moles + mass

moles + mass

convert b/w moles + mass using Molar Mass

moles + mass

convert b/w moles + mass using Molar Mass

Molar Mass \rightarrow mass of a mole of a substance

moles + mass

convert b/w moles + mass using Molar Mass

Molar Mass → mass of a mole of a substance

↳ for elements → atomic mass on periodic table

moles + mass

convert b/w moles + mass using Molar Mass

Molar Mass → mass of a mole of a substance

↳ for elements → atomic mass on periodic table $\frac{12.0 \text{ g C}}{1 \text{ mol C}}$

moles + mass

convert b/w moles + mass using Molar Mass

Molar Mass → mass of a mole of a substance

↳ for elements → atomic mass on periodic table

$$\frac{12.0 \text{ g C}}{1 \text{ mol C}}$$

for compounds

moles + mass

convert b/w moles + mass using Molar Mass

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$$\text{NaCl: } \frac{58.5 \text{ g NaCl}}{1 \text{ mol NaCl}}$$

$$\text{H}_2\text{O: } \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}}$$

Calculations

$$20.0 \text{ g HCl} = \underline{\quad?} \text{ mol HCl}$$

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$$20.0 \text{ g HCl} \times \frac{\text{mol HCl}}{\text{g HCl}}$$

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$$20.0 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}}$$

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Calculations

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g \longrightarrow mol (use Molar Mass!)

$$20.0 \cancel{\text{g HCl}} \times \frac{1 \text{ mol HCl}}{36.5 \cancel{\text{g HCl}}} = 0.54 \text{ mol HCl}$$

Calculations

$$20.0 \text{ g HCl} = \text{? mol HCl}$$

g \longrightarrow mol (use Molar Mass!)

$$20.0 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}} = 0.54 \text{ mol HCl}$$

$$16.0 \text{ mol CuSO}_4 = \text{? g CuSO}_4$$

Calculations

$$20.0 \text{ g HCl} = \text{? mol HCl}$$

$\text{g} \longrightarrow \text{mol}$ (use Molar Mass!)

$$20.0 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}} = 0.54 \text{ mol HCl}$$

$$16.0 \text{ mol CuSO}_4 = \text{? g CuSO}_4$$

$$16.0 \text{ mol CuSO}_4 \times \frac{160 \text{ g CuSO}_4}{1 \text{ mol CuSO}_4}$$

Calculations

$$20.0 \text{ g HCl} = \text{? mol HCl}$$

$\text{g} \longrightarrow \text{mol}$ (use Molar Mass!)

$$20.0 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}} = 0.54 \text{ mol HCl}$$

$$16.0 \text{ mol CuSO}_4 = \text{? g CuSO}_4$$

$$16.0 \text{ mol CuSO}_4 \times \frac{160 \text{ g CuSO}_4}{1 \text{ mol CuSO}_4} = 2560 \text{ g CuSO}_4$$

mol \leftrightarrow $\begin{matrix} \text{f.i.} \\ \text{molec} \end{matrix}$

mol \leftrightarrow $\begin{matrix} \text{fu} \\ \text{molec} \end{matrix}$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 = \underline{\quad? \quad}$ fu $\text{NaC}_2\text{H}_3\text{O}_2$

mol \leftrightarrow $\begin{matrix} \text{f.u.} \\ \text{molec} \end{matrix}$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 = \underline{\quad? \quad}$ f.u. $\text{NaC}_2\text{H}_3\text{O}_2$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 \times \underline{\hspace{2cm}}$

mol \leftrightarrow $\frac{\text{fu}}{\text{molec}}$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 = \underline{\quad? \quad}$ fu $\text{NaC}_2\text{H}_3\text{O}_2$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 \times \frac{\text{fu } \text{NaC}_2\text{H}_3\text{O}_2}{\text{mol } \text{NaC}_2\text{H}_3\text{O}_2}$

mol \leftrightarrow $\begin{matrix} \text{fu} \\ \text{molec} \end{matrix}$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 = \underline{\quad? \quad}$ fu $\text{NaC}_2\text{H}_3\text{O}_2$

24.9 mol $\text{NaC}_2\text{H}_3\text{O}_2 \times \frac{6.022 \times 10^{23} \text{ fu } \text{NaC}_2\text{H}_3\text{O}_2}{1 \text{ mol } \text{NaC}_2\text{H}_3\text{O}_2}$

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$$24.9 \cancel{\text{mol NaC}_2\text{H}_3\text{O}_2} \times \frac{6.022 \times 10^{23} \text{ f.u. NaC}_2\text{H}_3\text{O}_2}{1 \cancel{\text{mol NaC}_2\text{H}_3\text{O}_2}} = 1.49 \times 10^{25} \text{ f.u. NaC}_2\text{H}_3\text{O}_2$$

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$$1.51 \times 10^{24} \text{ molec H}_2\text{SO}_4 = \underline{\quad? \quad} \text{ mol H}_2\text{SO}_4$$

mol \leftrightarrow $\begin{matrix} \text{fu} \\ \text{molec} \end{matrix}$

$$24.9 \text{ mol NaC}_2\text{H}_3\text{O}_2 = \underline{\quad? \quad} \text{ fu NaC}_2\text{H}_3\text{O}_2$$

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$$1.51 \times 10^{24} \cancel{\text{molec H}_2\text{SO}_4} \times \frac{1 \text{ mol H}_2\text{SO}_4}{6.022 \times 10^{23} \cancel{\text{molec H}_2\text{SO}_4}} = 2.49 \text{ mol H}_2\text{SO}_4$$